THAT WHICH IS CLAIMED:

1. A susceptor for minimizing or eliminating thermal gradients that affect a substrate wafer during epitaxial growth, said susceptor comprising:

a first susceptor portion including a surface for receiving a semiconductor substrate wafer thereon; and

a second susceptor portion facing said substrate-receiving surface and spaced from said substrate-receiving surface, said spacing being sufficiently large to permit the flow of gases therebetween for epitaxial growth on a substrate on said surface, while small enough for said second susceptor portion to heat the exposed face of a substrate to substantially the same temperature as said first susceptor portion heats the face of a substrate that is in direct contact with said substrate-receiving surface.

2. A barrel-type susceptor according to Claim 1.

3. A pancake-type susceptor according to Claim 1.

4. A susceptor according to Claim 1 wherein said first susceptor portion is formed of a material that is thermally responsive to electromagnetic radiation.

5. A susceptor according to Claim 1 wherein said second susceptor portion is formed of a material that is thermally responsive to electromagnetic radiation.

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6. A susceptor according to Claim 1 wherein said first and second portions are formed of the same material.

7. A susceptor according to Claim 1 wherein said first and second portions are formed of different materials.

8. A susceptor according to Claim 1 wherein said first susceptor portion is formed of graphite coated with silicon carbide.

9. A susceptor according to Claim 1 wherein said second susceptor portion is formed of graphite coated with silicon carbide.

10. A susceptor according to Claim 1 wherein said substrate receiving surface further comprises a plurality of wafer pockets.

11. A method for minimizing or eliminating thermal gradients that affect a substrate during epitaxial growth, the method comprising:

heating a portion of a susceptor that faces, but avoids contact with, a semiconductor substrate and that is spaced sufficiently far from the substrate to permit the flow of gases between the substrate and the susceptor portion to encourage epitaxial growth on the substrate facing the susceptor portion.

12. A method according to Claim 11 and further comprising concurrently heating a second susceptor portion upon which the wafer rests so that the exposed face of the substrate is heated to substantially the same temperature as is the face of the substrate that is in direct contact with the second susceptor portion.

13. A method according to Claim 11 wherein the heating step comprises irradiating a susceptor that is thermally responsive to certain frequencies of the electromagnetic radiation with electromagnetic radiation within the range of those certain frequencies.

14. A method according to Claim 12 and further comprising the step of directing source gases to flow between the heated susceptor portions.

15. A method according to Claim 12 wherein the source gases are selected from the group consisting of silane, ethylene, propane and mixtures thereof.

16. A method according to Claim 12 wherein the source gases comprise trimethyl gallium and ammonia.

17. A method according to Claim 14 and further comprising the step of preparing the substrate surface for growth.

18. A method according to Claim 17 wherein the substrate comprises silicon carbide, and the surface preparation comprises an oxidation step followed by a chemical etching step to remove the oxidized portion.

19. A method according to Claim 17 wherein the substrate comprises silicon carbide, and the surface preparation comprises dry etching the silicon carbide surface.

20. A method according to Claim 17 wherein the surface preparation comprises lapping and polishing the substrate surface.

21. A chemical vapor deposition system comprising:

a reactor vessel formed of a material substantially transparent to electromagnetic radiation;

a gas supply system in fluid communication with said reactor vessel;

a source of electromagnetic radiation external to said reaction vessel; and

a susceptor within said reaction vessel, and formed of a material that is thermally responsive to electromagnetic radiation, said susceptor comprising,

a first susceptor portion including a surface for receiving a semiconductor substrate wafer thereon; and

a second susceptor portion facing said substrate-receiving surface and spaced from said substrate-receiving surface, said spacing being sufficiently large to permit the flow of gases therebetween for epitaxial growth on a substrate on said surface, while small enough for said second susceptor portion to heat the exposed face of a substrate to substantially the same temperature as said first susceptor portion heats the face of a substrate that is in direct contact with said substrate-receiving surface.

22. A chemical vapor deposition system according to Claim 21 wherein said reaction vessel is made of quartz.

23. A chemical vapor deposition system according to Claim 21 wherein said reaction vessel is made of stainless steel.

24. A chemical vapor deposition system according to Claim 21 wherein said source of electromagnetic radiation comprises an induction coil surrounding said reaction vessel.

25. A chemical vapor deposition system according to Claim 21 wherein said first and second portions are formed of the same material.

26. A chemical vapor deposition system according to Claim 21 wherein said first and second portions are formed of different materials.

27. A chemical vapor deposition system according to Claim 21 wherein said first susceptor portion is formed of graphite coated with silicon carbide.

28. A chemical vapor deposition system according to Claim 21 wherein said second susceptor portion is formed of graphite coated with silicon carbide.

29. A chemical vapor deposition system according to Claim 21 wherein said substrate receiving surface on said first substrate portion comprises a plurality of wafer pockets.

30. A chemical vapor deposition system according to Claim 21 wherein said susceptor comprises:

a cylinder formed of a plurality of adjacent straight sidewall sections that define the cylinder; and

a plurality of wafer pockets on the inner circumference of said cylinder.

31. A chemical vapor deposition system according to Claim 21 wherein said first susceptor portion comprises a first cylinder formed of a plurality of adjacent straight sidewall sections that define the cylinder; and

a plurality of wafer pockets on the outer surface of said sidewall sections; and

said second susceptor portion comprises a second cylinder surrounding said first cylinder and defining an annular space between said first and second cylinders, with the annular space between said first and second cylinders being

sufficiently large to permit the flow of gases therebetween for epitaxial growth on substrates in said wafer pockets, while small enough for said second cylinder to heat the exposed face of substrates to substantially the same temperature as said first cylinder heats the faces of substrates that are in direct contact with said first cylinder.

32. A chemical vapor deposition system according to Claim 21 wherein said first susceptor portion is a horizontal platform having a top surface for receiving semiconductor substrate wafers thereon; and

said second susceptor portion is parallel to and spaced above said wafer-receiving surface of said first susceptor portion, said spacing being sufficiently large to permit the flow of gases therebetween for epitaxial growth on a substrate on said surface, while small enough for said second susceptor portion to heat the exposed face of a substrate to substantially the same temperature as said first susceptor portion heats the face of a substrate that is in direct contact with said substrate-receiving surface.

33. A susceptor for minimizing or eliminating thermal gradients across a substrate wafer, said susceptor comprising:

a cylinder formed of a plurality of adjacent straight sidewall sections that define the cylinder, said cylinder being formed of a material that is thermally responsive to selected frequencies of electromagnetic radiation; and

a plurality of wafer pockets on the inner circumference of said cylinder.

34. A susceptor according to Claim 33 wherein said sidewalls define an inverted truncated cone.

35. A susceptor according to Claim 33 wherein said susceptor material in said cylinder is thermally responsive to radio frequencies.

36. A susceptor according to Claim 33 wherein said cylinder is formed of graphite coated with silicon carbide.

37. A susceptor for minimizing or eliminating thermal gradients across a substrate wafer, said susceptor comprising:

a first cylinder formed of a plurality of adjacent straight sidewall sections that define the cylinder, said cylinder being formed of a material that is thermally responsive to selected frequencies of electromagnetic radiation;

a plurality of wafer pockets on the outer surface of said sidewall sections; and

a second cylinder surrounding said first cylinder and defining an annular space between said first and second cylinders, said second cylinder being made of a material that is thermally responsive to selected frequencies of electromagnetic radiation, with the annular space between said first and second cylinders being sufficiently large to permit the flow of gases therebetween for epitaxial growth on substrates in said wafer pockets, while small enough for said second cylinder to heat the exposed face of substrates to substantially the same temperature as said first cylinder heats the faces of substrates that are in direct contact with said first cylinder.

38. A susceptor according to Claim 37 wherein said first and second cylinders are formed of the same material and are responsive to the same frequencies of electromagnetic radiation.

39. A susceptor according to Claim 37 wherein said first and second cylinders are thermally responsive to radio frequency electromagnetic radiation.

40. A susceptor according to Claim 37 wherein said first cylinder is formed of graphite coated with silicon carbide.

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41. A susceptor according to Claim 37 wherein said second cylinder is formed of graphite coated with silicon carbide.

42. A susceptor for minimizing or eliminating thermal gradients across a substrate wafer, said susceptor comprising:

a first susceptor portion formed of a material that is thermally responsive to selected frequencies of electromagnetic radiation, and having a top surface for receiving semiconductor substrate wafers thereon; and

a second susceptor portion parallel to and spaced apart from said wafer-receiving surface of said first susceptor portion and formed of a material that is thermally responsive to selected frequencies of electromagnetic radiation, said spacing being sufficiently large to permit the flow of gases therebetween for epitaxial growth on a substrate on said surface, while small enough for said second susceptor portion to heat the exposed face of a substrate to substantially the same temperature as said first susceptor portion heats the face of a substrate that is in direct contact with said substrate-receiving surface.

43. A susceptor according to Claim 42 wherein said first and second susceptor portions are horizontally oriented.

44. A susceptor according to Claim 42 wherein said first and second susceptor portions are formed of the same material and are responsive to the same frequencies of electromagnetic radiation.

45. A susceptor according to Claim 42 wherein said first and second susceptor portions are thermally responsive to radio frequency electromagnetic radiation.

46. A susceptor according to Claim 42 wherein said first susceptor portion is formed of graphite coated with silicon carbide.

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47. A susceptor according to Claim 42 wherein said second susceptor portion is formed of graphite coated with silicon carbide.

48. A susceptor according to Claim 42 wherein said top surface of said first susceptor portion includes a plurality of wafer pockets.